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peculiarities; he has found a great number of stars which contain in their spectra both bright and dark lines from the same origin, and which thus form in a sense an entirely new type.

" In the investigation of radial velocities his work is important. He has discovered about thirty spectroscopic binaries —a larger number than discovered by any other observer. One of these has such variations of radial velocity as to indicate two periods, and is therefore a triple system.

" In this time he directed one of the American expeditions sent to the Indies to observe the total solar eclipse of 1898. The results obtained regarding the spectrum and rotation of the solar corona are of the greatest interest.

" These many works assure M. CAMPBELL one of the first places among modern astronomers.

" The conclusions of this report are adopted by the Academy."

THE NEW YEAR'S TIME-SIGNALS FROM WASHINGTON, D. C.

The series of time-signals sent from the U. S. Naval Observatory throughout the United States at the beginning of the year created no little interest.

The standard clock of the observatory was connected by wire with the local telegraph-office and the beats of the clock were transmitted to all parts of the country. The electric connections of the clock are such as to omit certain seconds, enabling any one listening to a sounder to recognize the beginning of each minute and especially the first minute of the hour. The five seconds preceding the beginning of the minute are omitted, and for the beginning of the hour the ten seconds preceding are omitted. Hence the observer listening to the sounder is enabled to identify the hour, minute, and second of the Naval Observatory clock and compare it with his own.

The time-signals were received at this Observatory by telephone from the sounder in the Western Union office at San José at ten, eleven, and twelve o'clock, and a comparison made with the beats of a sounder electrically connected with our own standard clock. It so happened that the standard clock at this place was exactly correct at midnight, so that in making a comparison no correction was needed. At ten o'clock and eleven o'clock the comparisons were made by listening to both sounders—one through the telephone-receiver, the other in the telephone, both beside the observer. The sounders beat very nearly together, but it was thought that the Washington clock beat about $0^s.05$ after our own clock.

At twelve the two clocks were compared upon a chronograph—the observer in the telephone booth hearing only the beats of the Washington clock and recording them by breaking an electric circuit connected with the chronograph. The chronograph-sheet was read later, and for a series of twenty consecutive records showed the Washington clock to beat $+ 0^s.047$ later than our own.

It is proposed by the Naval Observatory to send out such signals each New Year, and no doubt, as people become familiar with the custom, a great deal of interest will be taken in the matter.

Note on Comet Brooks.

My observations of this interesting short-period comet from the date of its rediscovery, August 18, 1903, to October 24, 1903, are published in *Lick Observatory Bulletin,* No. 49. During this period the comet's brightness diminished rapidly, so that on the last date it was very difficult to make measures of it even with the great telescope.

Stormy weather and moonlight prevented further observations until December 10th, when it was found that a marked change had taken place in the comet's appearance. It was brighter than it had been when first observed in August, and had developed a nuclear condensation that was almost sharp enough to be called stellar. As the comet's distance from the Earth had meanwhile increased by nearly seventy millions of miles, this change must be credited to the internal activity of the comet, doubtless due to its passage through perihelion early in December.

An observation secured on January 15, 1904, shows that the comet will probably remain visible until March, if weather conditions are favorable.

R. G. Aitken.

January 19, 1904.